

ARI Research Note 2010-04

**List of U.S. Army Research Institute
Research and Technical Publications
for Public Release/Unlimited Distribution**

**Fiscal Year 2008
October 1, 2007 to September 30, 2008
With Author Index and Report Titles and Subject
Terms Index**



**United States Army Research Institute
for the Behavioral and Social Sciences**

November 2009

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**U.S. Army Research Institute
for the Behavioral and Social Sciences**

**A Directorate of the Department of the Army
Deputy Chief of Staff, G1**

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A handwritten signature in black ink that reads "Michelle Sams". The signature is fluid and cursive, with the first name "Michelle" and the last name "Sams" clearly distinguishable.

**MICHELLE SAMS, PhD.
Director**

Technical Review by

Dorothy E. Young, U.S. Army Research Institute

NOTICES

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NOTE: The views, opinions, and findings in this Research Note are those of the author(s) and should not be construed as an official Department of the Army position, policy, or decision unless so designated by other authorized documents.

Foreword

The means of dissemination of the results of the U.S. Army Research Institute for the Behavioral and Social Sciences' (ARI) research and development/studies and analysis program vary widely depending on the type of work, the subject matter, and the sponsor/proponent. Typically, major findings with immediate policy and procedural implications are briefed to sponsors and proponents in order to enable timely implementation. This is followed up with complete documentation in the form of research and technical publications such as the ones listed here. In many cases, these documents represent the actual item handed off to the sponsor/proponent; this is particularly true of the Research Product category. In other cases, results are published in order to provide a complete record of the work done, and for future reference by researchers doing work in the same or similar areas.

This annotated list for FY 2008 provides an idea of both the depth and scope of the ARI research effort, and is a valuable resource for anyone interested in military psychology from either a scientific or operational perspective.

A handwritten signature in black ink that reads "Michelle Sams". The signature is fluid and cursive, with the first name "Michelle" and last name "Sams" clearly legible.

MICHELLE SAMS, PhD.
Director

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Introduction

The primary responsibility of the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) is to maximize Soldier effectiveness. ARI accomplishes its mission through research and development in the acquisition, training, utilization, and retention of Army personnel. ARI research and products affect every Army mission with a human performance component.

As convenient references for qualified agencies and individuals and sponsors, ARI publishes lists of its technical and research publications. This issue of the publication list describes reports published during the period October 1, 2007, to September 30, 2008. It contains the abstract of each publication and the bibliographic information needed to identify a publication. The abstracts have been written, as far as possible, to describe the principal research findings in non-technical terms; however, technical language is used to communicate efficiently the details of research analysis. Author and subject indexing provide access to individual reports and topics.

ARI Publications

ARI publications are divided into separate, consecutively numbered categories appropriate to their intended audience and function. During fiscal year 2008, the following types of research and technical reports were issued by ARI:

Technical Report (TR). A report of completed research intended primarily for dissemination to researchers.

Research Reports and Technical Reports published by the U.S. Army Research Institute for the Behavioral and Social Sciences are intended for sponsors of research and development (R&D) tasks and for other research and military agencies. Any findings ready for implementation at the time of publication are presented in the last part of the Executive Summary. Upon completion of a major phase of the task, formal recommendations for official action normally are conveyed to appropriate military agencies by briefing or memorandum.

Research Report (RR). A report of completed research intended primarily for dissemination to military managers. Research Reports may deal with policy-related issues but typically do not include specific policy recommendations.

Research Product (RP). A user-oriented report intended to aid Army personnel. Examples are handbooks, manuals, and guidebooks.

Special Report (S). A published report on a topic of special interest or in-house research intended primarily for dissemination to a select audience.

Study Report (SR). A published report briefly documenting studies and analyses.

Study Note (SN). A Study Note may contain or consist of technical text, computer code, diskettes or tapes with software, databases, codebooks or other documentation, raw data, data collection instruments, figures, tables, or any other products that do not concisely convey the import of a project but which must be archived for technical completeness.

Research Note (RN). An interim, or final report typically of limited interest outside of ARI. It is filed with the Defense Technical Information Center (DTIC) but is not printed. Research Notes usually fall into one of the following categories:

- An in-house report that is of limited interest outside of ARI but is considered worth submitting to DTIC to be part of the Department of Defense (DoD) archive of technical documentation.
- An interim contract report that is of limited interest outside of ARI but is considered worth submitting to DTIC to be part of the DoD archive of technical documentation.
- A final contract report that is of limited interest outside of ARI but must be submitted to DTIC in accordance with Department of the Army regulations to close a contract.
- Material related to a Research Report or Technical Report (detailed tables, graphs, charts, sample forms, and sample training and testing materials) published as a Research Note to economize on printing and distribution.

Contractor Report (CR). An interim, or final report by a contractor that meets contractual obligations but is not defined by the other report categories.

ARI Distribution

Initial distribution of these publications is made directly by ARI. Research Reports, Technical Reports, Study Reports, and Research Products are distributed primarily to

operational and research facilities and their sponsors in DoD, to other interested Government agencies, and to DTIC; copies of some reports are also sent to libraries participating in the Documents Expediting Project. Research Notes, Study Notes, and Contractor Reports are filed with DTIC but are not published.

These publications are NOT available from ARI. DoD agencies and contractors can purchase paper copies or microfiche from:

Defense Logistics Agency
Defense Technical Information Center
8725 John J. Kingman Road, Suite 0944
Ft. Belvoir, VA 22060-6218
(703) 767-9030 or DSN 284-9030
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U.S. Department of Commerce
National Technical Information Service
5285 Port Royal Road
Springfield, VA 22161
(703) 487-4650
<http://www.ntis.gov>

NOTE: When requesting copies of these reports, use the DTIC accession number (AD - - - - -) appearing in parentheses following the date of publication of each citation.

Technical Reports

TR 1213

Cognitive Task Analysis of the Battalion Level Visualization Process

Dennis K. Leedom , William McElroy, Scott B. Shadrick, Carl Lickteig, Robert A. Pokorny, Jacqueline A. Haynes, & James Bell. October 2007. (ADA474884)

This technical report describes the results of a cognitive task analysis to identify important skill areas associated with visualization at the battalion level of command. The analysis consisted of a review of current U.S. Army doctrinal literature, a review of battalion visualization from a psychological perspective, and a series of interviews with military officers having recent combat experience in either a command position or as a battalion Operations Officer or Executive Officer. Based on findings from the cognitive task analysis, 11 skill areas were identified as potential focal points for future training development. The findings were used to design and develop exemplar training exercises for selected skills. This report documents findings and recommendations from the cognitive task analysis, and describes the design, development, and field test of exemplar training vignettes used to evaluate the cognitive task analysis findings and recommended training methods.

TR 1214

Training Wayfinding; Natural Movement in Mixed Reality

Ruthann Savage. October 2007. (ADA474915)

This report describes an experiment that investigated a prototype mixed reality (MR) system, utilizing the Battlefield Augmented Reality System (BARS), for training wayfinding. BARS is a mobile augmented reality system that uses a head mounted display (HMD) and a wireless system that tracks the users' head position and orientation. In this application a graphic representation of an office space was used as a virtual environment (VE), through which users walked using natural movement. Sixty participants in three rehearsal conditions - drawing the route on a map, actual physical space, and MR - were trained to traverse a path through a complex area as quickly and accurately as possible. Transfer of training measures included route knowledge (time to complete the route and the number of errors committed) and survey knowledge (the ability to orient oneself to the environment and identify the location of the beginning and end of the route). MR participants performed as well as those who rehearsed by drawing the route on a map, in both route and survey knowledge, but not as well as those who rehearsed in the actual space, without reporting symptoms of simulator sickness, common to work in VE. The addition of natural movement to a VE may enhance training through proprioceptive feedback.

TR 1215**Effects of Spatial and Non-Spatial Multi-Modal Cues on Orienting of Visual-Spatial Attention in an Augmented Environment**

Christian J. Jerome. October 2007. (ADA475115)

Visual search tasks are known to be cognitive capacity demanding and therefore may be improved by training in an augmented reality (AR) environment. During the experimental task, 64 participants searched for enemies (while cued from visual, auditory, tactile, combinations of two, or all three modality cues) and tried to shoot them while avoiding shooting the civilians (fratricide) for two 2-minute low-workload scenarios, and two 2-minute high-workload scenarios.

The results showed significant benefits of attentional cueing on visual search task performance. These benefits were revealed by improved performance in reaction time and accuracy from the haptic cues alone, auditory cues alone, and the combination of the visual and haptic cues together. Fratricide occurrence was shown to be amplified by the presence of the audio cues. The two levels of workload produced differences within individual's task performance for accuracy and reaction time. Accuracy and reaction time were significantly better with the medium cues than all the other cue specificities and the control condition during low workload and marginally better during high workload. Cue specificity generally resulted in better accuracy and reaction time with the medium cues.

TR 1216**Conceptualizing Multicultural Perspective Taking Skills**

Joan R. Rentsch, Allison Gundersen, Gerald F. Goodwin, & Allison Abbe.
November 2007. (ADA475103)

U. S. Army leaders are increasingly required to engage in full-spectrum operations that include a multinational or multicultural component. Army leaders must develop cultural understanding and skills in order to work effectively in multinational alliances, to anticipate and respond to adversary intent, and to interact successfully with local populations. The ability to take the perspective of *individuals* within the context of their culture enables Army leaders to understand other cultures at a level finer than that afforded by simply using global cultural dimensions alone. Perspective taking is a skill that may play a role in working effectively with diverse individuals across cultural boundaries. Individual level perspective taking is a cognitive process by which an individual is able to identify the thoughts and/or feelings of another. The competencies identified as contributing to multicultural perspective taking include fundamental competencies of self-awareness, personal and interpersonal skills, and regional expertise, and advanced competencies of extraction, interpretation, and a schema for culture. This paper describes a conceptual framework for multicultural perspective taking skills and makes recommendations for training those skills.

TR1217**Understanding aspects of individual and collaborative skill acquisition in face-to-face and distance training situations**

Adrienne Y. Lee, Douglas J. Gillan, & Nancy Cooke. November 2007. (ADA475102)

Programmatic learning and transfer studies were conducted in co-located and distributed contexts to investigate team-level acquisition of knowledge, use of communication, and establishment and maintenance of trust in complex simulations of military tasks. In these studies, team training occurred in co-located or in distributed contexts, and testing occurred in the same or in an opposite context. Across studies, team performance in distributed contexts was greater than for co-located teams. At initial transfer, all teams showed performance decrements but performance subsequently improved. Results for communication conditions revealed physical context effects at transfer. Results of team-level antecedents to trust, propensity to trust, and trust behaviors indicate that team trust can be built equally well in co-located or in distributed situations if team members are confident in their ability and competence in doing their tasks. Overall, improvements in both training and learning theory are suggested by identifying several variables that affect team performance in context

TR 1218**IkeNet: Social Network Analysis of E-mail Traffic in the Eisenhower Leadership Development Program**

MAJ Ian McCulloh, 2LT Grace Garcia, 2LT Kelsey Tardieu, 2LT Jennifer MacGibbon, Heather Dye, MAJ Kerry Moores, LTC John M. Graham, & Daniel B. Horn. November 2007. (ADA475135)

Social network analysis (SNA) has become an important analytic tool for analyzing terrorist networks, friendly command and control structures, and a wide variety of other applications. In this project we collect social network data from a group of 24 Army officers in a one-year graduate program at Columbia University. In this report we discuss methodological issues associated with collecting e-mail social networks and include source code for an add-in to Microsoft Outlook to aid in this process. These data were investigated for patterns and trends in mutual, asymmetric, and null dyads. Behavioral changes in the group resulting from awareness of one's position in social network were also studied. Additionally, comparisons were made between SNA data derived from e-mail traffic and from questionnaires. The differences between these two types of networks are important concerns when considering the implementation of SNA as a command and control tool for friendly forces.

TR 1219 Cancelled

TR 1220**Training for Efficient, Durable, and Flexible Performance in the Military**

Alice F. Healy, Erica L. Wohldmann, James A. Kole, Vivian I. Schneider, Kathleen M. Shea, & Lyle E. Bourne, Jr. January 2008. (ADA477325)

Progress has been made on the following topics concerning training for efficient, durable, and flexible performance in the military: (a) dealing with information flow, (b) factors promoting adaptive and flexible performance, and (c) coping with dynamic environments and changing task demands.

TR 1221**Comprehension and memory of spatial and temporal event components**

Gabriel A. Radvansky. January 2008. (ADA477195)

Across three experiment series, we assessed how people update mental representations of events (called situation models). The first series decomposed spatial and temporal updating with people reading texts. These components involved (a) processing shift signals, (b) establishing new frameworks, (c) maintaining relevant objects, and (d) removing irrelevant objects. We observed component independence. The second and third series assessed cognition as people moved through virtual spaces. In the second series, we found that information about objects was less accessible when there was a spatial shift, particularly for objects the person was currently carrying. This suggests that people operating in complex environments, such as urban battlegrounds, can be negatively affected by the structure of those environments and their interaction with them. For the third series, people first memorized a map of a building. Then they navigated a virtual simulation of the building and were probed with object name pairs. We observed that memory for objects in a person's current location was more available. Second, memory for objects along pathways, that a person passed through but did not interact with, was suppressed. These findings suggest that some prior knowledge of environments may actually be less available by the very act of navigating that space.

TR 1222**Development of a Test Battery to Assess Mental Flexibility Based on Sternberg's Theory of Successful Intelligence**

Cynthia T. Matthew, Jens F. Beckman, & Robert J. Sternberg. January 2008. (ADA477193)

A test battery to assess mental flexibility was developed based on Sternberg's theory successful intelligence (1985). New mental flexibility assessment instruments were developed and underwent formative and summative evaluation. The newly developed mental flexibility tests showed adequate reliability, and preliminary evidence of construct- and criterion-related validity. One mental flexibility factor explained 70% of variance in the test battery and was differentiated from the latent factor underlying divergent and convergent measures of fluid intelligence. Preliminary evidence of incremental criterion-related validity was found, suggesting that the mental flexibility test

battery explains variance above and beyond divergent and convergent measures of fluid intelligence in criterion measures.

TR 1223

Automated Feedback and Situation Awareness in Net-Centric C3

John S. Barnett, & Jennifer M. Ross. February 2008. (ADA478164)

The goal of net-centric warfare (NCW) is to give Soldiers an information advantage that leads to a war-fighting advantage. However, NCW systems are quite complex and dynamic, characteristics which can lead to impaired situation awareness (SA) and increased mental workload. It has been suggested that an automated alerting system would help Soldiers focus their attention on mission critical events. This series of experiments investigated how automated audio-visual alerts affect user SA and perceived workload. Two similar experiments were conducted. In each experiment, participants viewed a simulation of a net-centric system, the Force XXI Battle Command Brigade and Below (FBCB2), which included an automated alerting system. SA and workload were measured both with the alerting system enabled and disabled. In the second study, the difficulty of the monitoring task was increased and the automated alerts included a pop-up pictorial representation of the critical event. Results indicate that automated alerting systems do not improve user SA, but they also do not impair user SA. However, mental workload was significantly lower when alerts were enabled. These results can be used to aid decisions about whether or not to include automated alerts in NCW systems.

TR 1224

Future-Oriented Experimental Army Enlisted Personnel Selection and Classification Project (Select21) Summary Report

Deirdre J. Knapp, Trueman R. Tremble, Teresa L. Russell, & Wayne S. Sellman. February 2008. (ADA478167)

New Predictors for Selecting and Assigning Future Force Soldiers (Select21) is concerned with Soldier accession and personnel classification. The Select21 goal was to ensure the Army acquires Soldiers with the knowledge, skills, and attributes (KSAs) needed for performing well and fitting well in a transformed Army. The objectives of the project were to (a) identify future job demands and the pre-enlistment KSAs required to meet them, (b) develop measures of job performance and critical KSAs, and (c) validate the experimental predictor measures using a concurrent criterion-related paradigm. The predictor set included measures of cognitive ability, temperament, psychomotor skills, values, expectations, and experience. Performance criteria included rating scales completed by supervisors and peers, technical knowledge tests, a situational judgment test, and indicators of person-environment fit (e.g., job satisfaction). Analyses indicated that scores from the Armed Services Vocational Aptitude Battery (ASVAB) predicted both current and future performance (as assessed by future-oriented rating scales) and that the experimental predictors provided incremental validity, particularly in regard to attitudinal criteria.

The present report summarizes the Select21 research at a high, relatively non-technical, level and discusses issues associated with further study and implementation of new measures.

TR 1225

A Valid, Culture-Fair Test of Intelligence

Joseph F. Fagan. March 2008. (ADA479963)

The question the present research addressed was whether a racially unbiased test of the ability to process information would predict how well young adults succeed in college classes. The technical barrier overcome was that current theories of intelligence are based on an assumption that all those taking IQ tests have had equal opportunity for exposure to the information being tested. Thus, past efforts to develop an intelligence test that is culture-fair have not been successful. The significance of the research is that it provides further evidence to evaluate a theory that defines intelligence as information processing ability (Fagan, 1992, 2000). Current research on a theory of intelligence as information processing finds racial differences in IQ to be due to cultural factors. A test of information processing is the first valid, culture-fair test of intelligence.

TR 1226

Learning the Lessons of Leadership: Case Method Teaching with Interactive, Computer-Based Tools and Film-Based Cases

Randall W. Hill, Julia M. Kim, Michelle Ramsden Zbylut, Andrew S. Gordon, Jason N. Ward, & Christopher L. Vowels. March 2008. (ADA479983)

The Army Excellence in Leadership (AXL) system is an online interactive system for delivering multimedia case method instruction. The intent of the AXL system is to develop leaders with greater interpersonal competence and cultural awareness. To achieve this goal, the AXL research program combines the case method of instruction with Hollywood techniques and interactive online technology. This report describes the technological capabilities of the AXL system, as well as the case method pedagogy underlying the AXL approach. The report describes how the AXL system capitalizes on the best practices of traditional case method instruction and addresses some of the limitations of case method instruction. Additionally, this report outlines how the instructional content in the AXL system relates to the leadership competencies outlined in Army leadership doctrine (FM 6-22) and the tacit knowledge framework for military leaders developed by Sternberg et al. (2000).

TR 1227**Formative Evaluation of a Massively Multi-Player Persistent (MMP) Environment for Asymmetric Warfare Exercises**

Michael J. Singer, Rodney Long, Jeffrey Stahl, & Laura Kusumoto. April 2008. (ADA480016)

The U.S. Army RDECOM-STTC conducted research on distributed, multi-player simulations for training dismounted Soldier tasks. They requested U.S. Army Research Institute support formative evaluations by supporting briefings, demonstrations, and collecting usability information during exercises. Two usability exercises addressed a standard checkpoint scenario, a third evaluation was conducted during an Army Post Emergency Operations exercise, and a final evaluation supported a pre-deployment Battalion Staff exercise. During evaluation and development, changes were made to the voice system, Semi-Automated Forces (OneSAF) were added, and simulated radio networks were implemented. Added functionality enabled Soldiers to conduct standard Army tasks and trainers to insert threats and conduct AARs. The Soldiers' indicated that working with a simulated three dimensional environment dramatically changed their approach to the mission. Conducting rehearsals within a low-fidelity simulation was considered an enhancement to the training value of field exercises. The gathered opinion-based information indicates that the system can prepare troops for more expensive live drills and actual deployment; integrating basic Warrior skills with reinforced situational awareness, decision making, and asymmetric warfare skills. The program is continuing with new development by RDECOM-STTC, and ARI is using the AW-VTT to research challenges in the use of distributed, game-based simulations for training Soldiers.

TR 1228**Leadership: Enhancing Team Adaptability in Dynamic Settings**

Katherine J. Klein, & Steve W. J. Kozlowski. April 2008. (ADA493546)

To perform complex, interdependent, and urgent tasks in uncertain, unfamiliar, and often treacherous environments, the U.S. Army must be responsive, agile, versatile, and sustainable. These are the hallmarks of adaptive team performance—the ability of team members to individually and cooperatively apply their knowledge and skills to the resolution of urgent, complex, novel, and ambiguous problems in dynamic work settings. Theory and research regarding the individual, team, and leader processes and characteristics that foster adaptive team performance are, unfortunately, quite limited. We conducted five interrelated research projects, combining research methods and approaches—including comprehensive foundational literature reviews, theory development, experimental research in a laboratory setting, qualitative case study research, and longitudinal survey research in the field—to build new understanding of the ways in which leaders may enhance team learning, coordination, and adaptive performance in dynamic work environments.

TR 1229**Training to Operate a Simulated Micro-Unmanned Aerial Vehicle with Continuous or Discrete Manual Control**

Paula J. Durlach, John L. Neumann, & Deborah R. Billings. May 2008.
(ADA482410)

This report investigates the effects of continuous vs. discrete control methods and the number of simultaneous camera views on operator performance during training to manually control a simulated micro-unmanned aerial vehicle (MAV). Seventy-two participants were trained to operate a MAV in a simulated environment, to designated criterion levels. They were then given training missions during which performance was measured. Eight conditions were investigated, formed by crossing three 2-level factors: input device (mouse vs. game controller), input control display (discrete vs. continuous), and number of simultaneous camera views (one vs. two). Superior performance was observed when a continuous input method (e.g., multiple degrees of freedom) was provided for continuous MAV functions (e.g. maneuvering in space) and a discrete input method (e.g., single action) was provided for discrete MAV functions (e.g., command to hover). Under these conditions, mission times were shorter, collisions were fewer, and more targets were photographed. Effects of video game experience and spatial ability were also investigated. Recommendations for the design of unmanned vehicle controls were discussed.

TR 1230**The Perception and Estimation of Egocentric Distance in Real and Augmented Reality Environments**

Christian J. Jerome, & Bob G. Witmer. May 2008. (ADA493544)

Previous research using verbal judgments of distance have shown distances tend to be underestimated. The extent to which distances are underestimated is greater with virtual environments than with real world environments. The goal of the current experiment was to test the difference in the perception of distance to real and virtual objects using verbal estimation and manual replication. Recent empirical studies are providing data on human interactions with augmented reality technology that are essential for determining the usefulness of current augmented reality (AR) for training and performance enhancement. The equipment used in this research included hardware and software for presenting virtual objects in an AR environment, and the participants were 32 college students. Replication procedure significantly improves the estimation of the previously viewed object distance. Distance estimates to real objects in a real environment were significantly better than they were to virtual objects in an augmented environment. These results lend further support to the notion that verbal estimates of distance do not accurately represent perceived distance. Unless the task being performed specifically requires a numerical estimate of distance, it is recommended that methods similar to our distance replication method be used to accurately determine perceived distance.

TR 1232**The Effects of Seductive Details on Recognition Tests and Transfer Tasks**

Annette Towler, & Kurt Kraiger. June 2008. (ADA483155)

This research focuses on the investigation of pre-training and in-training events that facilitate effective learning and the transfer of knowledge and skills acquired through distributed learning. We tested training effectiveness principles in the context of suboptimal learning. Specifically, we investigated the seductive details phenomenon, a condition in which the inclusion of interesting information irrelevant to the training objectives reduces trainee learning. In terms of our findings, we found no effect of seductive details on recall tests in the experiments. This finding is contrary to much of the previous research that has found that providing seductive details distracts trainees from learning and results in lower scores on recall tests than those who are not exposed to seductive details. However, we did find support for our proposition that inclusion of seductive details benefits transfer performance. These findings suggest that to enhance transfer, distributed learning designers should incorporate interesting yet tangential features into the technology.

TR 1233**Performance Appraisal Feedback: A Foundation for Effective Self-Development**

Karin A. Orvis. June 2008. (ADA483157)

The U.S. Army's Leader Development Program relies on three development methods: institutional training and education, operational assignments, and self-development. The value of a self-development as a means for employee development has also been recognized in the private sector as well as in other public organizations. Unfortunately, empirically-based evidence concerning how the Army (and other organizations) can support and enhance employee self-development efforts is far from comprehensive. Prior research examining self-development in the public and private sector has focused on factors that stimulate the quantity of self-development participation. Yet, meaningful development in an individual's job knowledge and skills is contingent on the quality of self-development activities in which one participates, not simply the quantity of self-development. The present study developed and tested a model of the effects of supervisory performance appraisal feedback on the quality of employees' self-development choices. Data collected generally supported the model. Results suggest that supervisory feedback shapes the quality of an employee's subsequent self-development choices both directly and indirectly through its influence on employee self-regulation. Furthermore, results suggest that the attributes of feedback combine both additively and multiplicatively to influence self-regulation. Implications for fostering self-development in the Army are discussed.

TR 1234**Effects of Input Device and Latency on Performance While Training to Pilot a Simulated Micro-Unmanned Aerial Vehicle**

Paula J. Durlach, & Deborah R. Billings. July 2008. (ADA493588)

The effects of input device and latency in training to manually pilot a simulated micro-aerial vehicle (MAV) were investigated. Our prior research suggested that performance was superior when using a game controller as opposed to a mouse during missions in which maneuvering skill and attention to sensory imagery were critical. This experiment investigated whether effects would persist when participants were tested in a novel environment and when some realistic latency was imposed between input command and MAV response. Fifty-six participants were trained to operate a MAV in one simulated environment and then tested with two new missions in a novel environment. Four between-group conditions were examined, formed by crossing two 2-level factors: input device (game controller vs mouse) and latency period (no time delay vs. 500 ms delay). The effects of input device replicated our prior research and also transferred to the novel environment, suggesting that input device rather than spatial learning was responsible for the differences in performance. No substantial effects of delay were found.

TR 1235**Change Detection in Social Networks**

MAJ Ian McCulloh, 2LT Matthew Webb, LTC John M. Graham, Kathleen Carley, & Daniel B. Horn. June 2008. (ADA484611)

Social network analysis (SNA) has become an important analytic tool for analyzing terrorist networks, friendly command and control structures, and a wide variety of other applications. This project proposes a new method for detecting change in social networks over time, by applying a cumulative sum statistical process control statistic to normally distributed network measures. The proposed method is able to detect organizational change in the same manner as a quality engineer can detect a change in a manufacturing process. The new algorithm is demonstrated on social network data collected on a group of 24 Army officers going through a 1-year graduate program at Columbia University and on al-Qaeda leading up to and immediately following the terrorist attacks of September 11, 2001.

TR 1236**Modeling the Direct and Indirect Determinants of Different Types of Individual Job Performance**

Jeff W. Johnson, Emily E. Duehr, Sarah A. Hezlett, John P. Muros, & Kerri L. Ferstl. June 2008. (ADA484640)

Despite the importance of citizenship performance and adaptive performance to Army junior commissioned officer job performance, there has been very little published research studying these constructs in a military setting and there is no well-established model of the process by which individual differences predict citizenship or adaptive

performance. The purpose of this research was to test a model of the process through which individual difference variables work to influence performance on specific performance dimensions. To test this model, we assembled and developed a battery of instruments that are construct-valid measures of each component of the model and administered them to 155 ROTC cadets. Results supported our model with some modifications. Individual differences in ability, personality, and experience influence performance through the mediating variables of knowledge, skill, and three components of motivation (motives, proactive cognitions, and self-regulation). A different model was found to describe the process depending on whether the performance dimension was an element of task, citizenship, or adaptive performance.

TR 1237

Evaluating the O*NET Occupational Analysis System for Army Competency Development

Teresa L. Russell, Andrea Sinclair, Jesse Erdheim, Michael Ingerick, Kimberly Owens, Norman Peterson, & Kenneth Pearlman. July 2008. (ADA484632)

The present evaluation focused primarily on the usefulness of the O*NET system for Army occupational analysis for selection and classification purposes. The evaluation focused on the appropriateness of O*NET descriptors that would typically be used in an Army occupation analysis for selection and classification purposes: abilities, skills, generalized work activities [GWAs], and work context. Four civilian and four officer occupations were selected for this research. The objective was to produce data for the military occupations that could be compared to civilian O*NET data. Therefore, it was important to follow processes currently used by O*NET for data collection. In effect, this meant collecting information on occupational tasks, abilities skills, GWAs, and work context from Army Subject Matter Experts (SMEs) and collecting ability and skill ratings using trained analysts. The results showed that Army SMEs as well as other types of analysts could make reliable ratings on the O*NET descriptors. Potential uses for the O*NET descriptors are discussed.

Research Reports

RR 1879

Unit Information Management Practices at the Joint Readiness Training Center

Kenneth L. Evans, MAJ Richard P. Reese, & 1SG Louis Weldon. November 2007.
(ADA476071)

The present investigation sought to quantify unit information management (IM) practices at the Joint Readiness Training Center (JRTC) and to determine the extent to which a job performance aid, the IM Guide, might improve unit IM performance. IM practices were measured by observer/controllers using the IM Checklist, a tool developed especially for the investigation. Over the course of seven unit rotations at JRTC, 758 checklists were collected and analyzed. The IM Guide was found to be of benefit to companies, but not to either battalions or platoons. Overall, units were able to address specified information requirements fairly well, though they had much greater difficulty answering implied requirements. In terms of information quality, units were better at providing accurate and reliable information than they were at providing complete and precise information. Units that included IM in their planning process and units that rehearsed their communication plans were more likely to have IM that enhanced mission accomplishment than units that did not do those two things.

RR 1884

Exploring the Potential Value of OneSAF at the Small-Unit Level

David R. James, Jean L. Dyer, & Richard L. Wampler. February 2008. (ADA480202)

OneSAF (one semi-automated force) provides intelligent, doctrinally-correct behaviors representing the modular force in the contemporary operating environment. The research determined the extent to which OneSAF (v1.0) could assist company and platoon leaders with tactical planning and assessed the potential value of using OneSAF in institutional training to train course of action (COA) development, analysis, and comparison. U. S. Army officers with combat experience participated. A Quick Start Guide was developed to assist with hands-on training during the experimental sessions. Results indicated that OneSAF could be a useful tool in training mission planning to company-level officers during institutional courses. OneSAF features were perceived to assist with learning COA development, analysis, and comparison, and to support the major factors viewed as valuable in operational planning. The major challenge to future versions of OneSAF is to make it easier to use and quicker to develop scenarios, while simultaneously maintaining the in-depth simulation features.

RR 1885

Training Effectiveness Assessment of Red Cape: Crisis Action Planning and Execution

Peter S. Schaefer, Scott B. Shadrack, Jeff Beaubien, & Brian T. Crabb. February 2008.
(ADA480003)

The crisis response training program Red Cape: Crisis Action Planning and Execution uses theme-based training and multimedia scenarios to instill expert thinking patterns in crisis response personnel. The training program was assessed in workshops conducted with the Army National Guard. Quantitative data indicate that cognitive performance—as reflected in both independent and self assessments—improves as a function of training. Furthermore, as training progressed, inflation in self-assessments decreased, indicating more accurate self-assessment of cognitive performance. Participant feedback from the participants indicates that the training program was seen as useful, efficient, and effective in improving crisis response cognitions.

RR 1886

Collaborative Planning in Network-Enabled Co-Located and Distributed Environments

William R. Sanders, & Christopher V. Fultz. March 2008. (ADA479998)

A defining feature of Army transformation will be the development of digital communications capabilities to support distributed battle command. To support new equipment development a realistic planning task is required which can yield an objective planning performance benchmark score. The Reactive Planning Strategies Simulation (REPSS) presents a group planning and resource allocation task that can be used to generate a benchmark performance score. The present research investigated whether a benchmark REPSS performance score could be established that demonstrates sensitivity to manipulations in planning task conditions, and planning group skills. Twenty-two groups of seven Soldiers (commander and three two-person teams) performed the REPSS planning task after being assigned to either a co-located or distributed team planning condition. Results indicated that the planning performance success score for groups in the distributed condition fell below the benchmark score for groups in the co-located condition. Participant group member characteristics (rank, planning experience, and previous deployments) were significantly related to successful performance for groups in the distributed planning condition. These results provide evidence that the REPSS simulation can be applied to develop a benchmark estimate of performance against which manipulations in task conditions and planning group expertise can be compared.

RR 1887

Fidelity Requirements for Army Aviation Training Devices: Issues and Answers

John E. Stewart, David M. Johnson, & William R. Howse. April 2008. (ADA493584)

The Future Aviation Simulation Strategies Study Group, sponsored by the U.S. Army Aviation Warfighting Center Directorate of Simulation, presented key questions to the Army Research Institute (ARI) regarding functional requirements (visual, motion, aerodynamic model) for Army helicopter simulators. The present report consists of ARI's responses to these questions, based upon current knowledge of the research. Among the key findings of the report: The prevailing institutional belief is that the simulator, in order to be training effective, must replicate the aircraft. Training consists of offloading flight hours from aircraft to simulator. These assumptions are not supported by scientific evidence. The belief that fidelity equals training effectiveness

still drives the acquisition and integration of simulators and training devices. Empirical transfer of training (ToT) experiments using aircraft as criteria are rare. Research has demonstrated that even high fidelity simulators can produce poor ToT to the aircraft, when traditional lock-step training programs are used. Contrariwise, simulators of lesser fidelity have demonstrated acceptable ToT when criterion-based training strategies were employed. The conclusion drawn from the ToT research is that instructional strategies are more important than simulator fidelity. Research on simulator motion shows that while motion may enhance performance in the simulator, it does not seem to impact transfer to the aircraft.

Research Products

RP 2008-01

A U.S. Army Reserve (USAR) Noncommissioned Officer (NCO) Tacit Knowledge Inventory: Flexible Structure for Squad-Level Leader Self-Development

Teresa Z. Taylor, Linda Higley, & David Grabarczyk. May 2008. (ADA483162)

Because the development of adaptive leaders is a top priority for the U.S. Army, the Army continuously seeks ways to improve its leader development programs. One way is by sponsoring research programs aimed at finding strategies to enhance leader competencies by examining the degree to which knowledge, particularly tacit knowledge (TK), contributes to a leader's effectiveness. TK is informal knowledge (not taught in institutions), accrued during the experience of operational assignments, and contributes to an individual's ability to problem-solve (e.g., how a leader establishes credibility upon assignment as a new leader). Improved problem-solving directly supports the Army's goal of growing adaptive leaders. Research suggests that TK levels reflect the culture of an organization through a shared mental model of how leader problems are solved. Thus far, the focus of TK research has been on identifying and mapping it among active Army officers at three leader levels, as well as measuring its relation to other leader competencies. The goal of this project is to identify and map TK among USAR Squad Level NCOs, and develop an inventory of this knowledge for use as a leader self-development tool. This research report summarizes the process by which the USAR NCO TK Inventory was developed.

RP 2008-02

After Action Review Tools for Dismounted Soldier Systems

Paul N. Blankenbeckler, Richard L. Wampler, and Michael D. Dlubac, & Jean L. Dyer. June 2008. (ADA483160)

This research examined tools and capabilities required to implement an embedded training (ET) after action review (AAR) support system in future dismounted Soldier systems to enhance the training of squads and platoons (small combat units). Dismounted Soldier systems are being designed and developed to increase battle command, situational awareness and understanding, and provide embedded training for the small unit. The context of the research was tools to assist the leader/trainer in conducting small-unit AARs. The effort examined projected system design requirements; AAR systems and capabilities employed at combat training centers and in virtual simulations; and AAR concepts and solutions explored during the Future Force Warrior Advanced Technology Demonstration. The analytic findings provide concepts for interactive system controls integrated into menus to facilitate the AAR process. The findings also provide tools to facilitate the integration of realistic firing engagements and casualty play during training. A suite of flexible tools was recommended which addresses the AAR ET requirement for the Ground Soldier System.

Study Reports

SR 2008-01

Cross-Cultural Competence in Army Leaders: A Conceptual and Empirical Foundation

Allison Abbe, Lisa M. V. Gulick, & Jeffrey L. Herman. October 2007. (ADA476072)

Military operations increasingly require Army leaders to anticipate the actions of, interact with, and influence individuals and groups whose cultural context differs widely from their own. The Army and other Services have responded by increasing the availability of language and regional training. These efforts develop the knowledge and skills needed to understand and interact with a particular population in a particular location. However, full-spectrum operations demand a broader cultural capability, whereby Army leaders are able to adapt successfully to any cultural setting. Meeting this capability will require the development of culture-general knowledge and skills as a necessary complement to language skills and regional knowledge. This report presents a framework for cross-cultural competence in Army leaders, reviews empirical research on predictors of intercultural effectiveness, and describes existing measures of cross-cultural competence and related constructs.

SR 2008-02

Longitudinal Junior Noncommissioned Officer Promotion Analysis

Christopher E. Sager, Shaobang Sun, Dan J. Putka, Kimberly S. Owens, & Tonia S. Heffner. October 2007. (ADA476023)

The Noncommissioned Officer (NCO) Promotion effort was undertaken to help the U.S. Army prepare noncommissioned officers to meet the needs of the future Army. In the earlier NCO21 project, concurrent validation evidence was collected to support the integration of measures of knowledges, skills, and aptitudes (KSAs) into the promotion system. This report documents the longitudinal validation of these measures. The predictor measures included the Leadership Judgment Exercise, Self-Description Inventory, Information Questionnaire-II, Experience and Activity Record, Work Suitability Inventory, and Personnel File Form. Observed and expected future performance rating scales were used to remotely collect criterion data via the Internet a little more than a year later. An additional criterion measure was whether participating Soldiers had been promoted during the project's research period. This project yielded some evidence supporting the longitudinal validity of the predictor measures and good evidence that the measures can effectively be administered via laptop computers.

SR 2008-04

Building Cultural Capability for Full-Spectrum Operations

Allison Abbe. February 2008. (ADA478179)

This report describes findings and recommendations from a research-based analysis on increasing linguistic and cultural capability in Army leaders and Soldiers.

Findings from a workshop and literature review strongly support the role of culture-general skills and affect. In particular, interpersonal skills, non-ethnocentric attitudes, and openness emerged from workshop discussions and the literature as some of the most consistent contributors to success in cross-cultural settings. Workshop discussions also emphasized that cultural capability must be addressed throughout DOTMLPF and recommended that culture be incorporated at all levels of training and education. Findings from this analysis have contributed a research perspective to the development of a culture and language strategy at TRADOC. This research can further be used in identifying and prioritizing learning domains for education, training and leader development. Findings point to areas where existing training can be strengthened and to gaps that future training and education can address.

SR 2008-05

Program Evaluation Metrics for U.S. Army Lifelong Learning Centers (LLCs): Extension to Military Operational Specialty (MOS)-Based LLCs

Anna T. Cianciolo. May 2008. (ADA484620)

Lifelong Learning Centers (LLCs) are the physical instantiation of the Army Training and Doctrine Command's (TRADOC's) lifelong learning concept. Previous research by the Army Research Institute for the Behavioral and Social Sciences (ARI) established a framework for assessing the effectiveness of LLCs. The present investigation sought to examine the generalizability of the LLC Assessment Framework and to apply the framework to assessing the Fort Gordon LLC. This effort also examined the requirements for enabling LLC self-assessment. Some modification to the assessment framework was necessary to include external factors that moderate the relation between outputs and outcomes. The assessment of the Fort Gordon LLC revealed that, overall, the outputs necessary to achieve educational transformation and impact were produced by the LLC staff and affiliated stakeholders. It was determined that people knowledgeable of educational theory and technology and capable of having extensive face-to-face contact with LLC stakeholders will be necessary for LLC self-assessment. This report provides recommendations for leveraging the LLC capabilities and for addressing external factors such that future staffing and development decisions enhance the impact of the lifelong learning initiative.

Research Notes

RN 2008-01

A Cost-Benefit Analysis Applied to Example Proposals for Army Training and Education Research

John E. Morrison, J. Dexter Fletcher, Franklin L. Moses, Eric J. Roberts, & Kathleen A. Quinkert. February 2008. (ADA477190)

The report was based on outcomes from the “Army Science of Learning Workshop” sponsored by the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) at the request of the U.S. Army Training and Doctrine Command (TRADOC). The present report took findings from the workshop and derived a research and development (R&D) program. The elements of the current analysis were 21 proposed R&D efforts derived from concepts discussed in the workshop. Total costs were calculated in two ways: (1) implementation and other costs were summed to estimate the first-year start-up (Y1) costs; and (2) long-term costs were calculated by adding maintenance to Y1 estimates, assuming a five-year time frame. The benefit of a proposed R&D effort was conceived as analogous to expected value—that is, an estimate of the work’s operational impact multiplied by the probability of successfully executing the work. These data were used to derive three types of proposal “packages”: (1) an optimal package that maximizes benefit and minimizes costs, (2) a package having a fixed budget that maximizes total benefit, and (3) a package for a stated level of benefit that minimizes costs. The analyses provided sensible alternative plans for a TRADOC R&D program.

RN 2008-02

Relations between Select21 Predictor Measures and First-Term Attrition

Dan J. Putka, & Kevin M. Bradley. February 2008. (ADA478180)

This report is based on a research effort concerned with Soldier accession and job classification and New Predictors for Selecting and Assigning Future Force Soldiers (Select21). The goal of Select21 is to ensure the Army acquires Soldiers with the knowledge, skills, and attributes (KSAs) needed for performing the type of tasks envisioned in a transformed Army. The objectives of the project are to (a) identify Future Force job demands and pre-enlistment KSAs required to meet them, (b) develop measures of job performance and critical KSAs, and (c) validate the experimental predictor measures against valued criteria.

This report summarizes attrition-related findings for Soldiers who participated in three Select21 reception battalion data collections: the pilot test (September-November 2003), faking research (January-February 2004), and field test (August-September 2004). The report provides estimates of the criterion-related validity of early estimates for pre-concurrent validation versions of the Select21 predictor measures for predicting first-term attrition. As such, the results provided in this report speak to the potential of the measures for selecting future Soldiers who are likely to complete their service obligations.

RN 2008-03 Cancelled

RN 2008-04

List of U.S. Army Research Institute Research and Technical Publications for Public Release/Unlimited Distribution Fiscal year 2007.

U.S. Army Research Institute for the Behavioral and Social Sciences. April 2008. (ADA481845)

ARI publishes lists of its technical and research publications as a convenient reference for qualified agencies and individuals and sponsors. This issue of the publication list describes reports approved for public release during the period October 1, 2006, to September 30, 2007. It contains the abstract of each publication and the bibliographic information needed to identify a publication. The abstracts have been written, as far as possible, to describe the principal research findings in non-technical terms; however, technical language is used to communicate efficiently the details of research analysis. Author and subject indexing provide access to individual reports and topics.

RN 2008-05

Training for Rapid Interpretation of Voluminous Multimodal Data

Dennis J. Folds, Carl T. Blunt, & Raymond M. Stanley. April 2008. (ADA480514)

Previous research has not specifically addressed rapid decision-making based on large amounts of data, although a large body of research has identified various biases and characteristic errors in human decision making that promote economy of information processing. The purpose of this series of experiments was to determine whether seven known characteristic error types operate in rapid decision-making, and to determine whether training to identify key contexts in which these errors are likely to occur can reduce their occurrence. Student volunteers across four experiments performed a simulated incident detection task using information in a variety of formats. Results supported the primary hypothesis that each of seven types of characteristic errors of interest occur in rapid decision making. A reduced tendency to commit false alarms occurs as a result of general alerting to the presence of error traps, although individuals who received specialized training to reduce the occurrence of characteristic errors performed no better than a control group. Team task performance greatly reduced undesirable false alarm errors, but also reduced desirable incident hits. Teams that received training reported the fewest hits and errors, although it was unclear whether this was a result of training or the effect of alerting observed in individuals.

RN 2008-07

Evaluating the O*NET Occupational Analysis System for Army Competency Development: Supplemental Appendices

Teresa L. Russell, Andrea Sinclair, Jesse Erdheim, Michael Ingerick, Kimberly Owens, Norman Peterson, & Kenneth Pearlman. July 2008. (ADA493578)

The present evaluation focused primarily on the usefulness of the O*NET system for Army occupational analysis for selection and classification purposes. The evaluation

focused on the appropriateness of O*NET descriptors that would typically be used in an Army occupation analysis for selection and classification purposes: abilities, skills, generalized work activities [GWAs], and work context. Four civilian and four officer occupations were selected for this research. The objective was to produce data for the military occupations that could be compared to civilian O*NET data. Therefore, it was important to follow processes currently used by O*NET for data collection. In effect, this meant collecting information on occupational tasks, abilities skills, GWAs, and work context from Army Subject Matter Experts (SMEs) and collecting ability and skill ratings using trained analysts. The results showed that Army SMEs as well as other types of analysts could make reliable ratings on the O*NET descriptors. Potential uses for the O*NET descriptors are discussed.

RN 2008-08

An Evolutionary Game Theory Model of Revision-Resistant Motivations and Strategic Reasoning

Craig DeLancey. August 2008. (ADA493545)

Strong reciprocity and other forms of cooperation with non-kin in large groups and in one-time social interactions is difficult to explain with traditional economic or with simple evolutionary accounts. Reciprocity can be costly, while in many instances earning little or no benefit to the individual or its kin. In Ultimatum Games, for example, humans tend in one-shot anonymous interactions towards equal distributions of goods at high individual cost, often encouraged through retributive actions that result in significant personal cost. In this research, an agent-based genetic algorithms model is used to show that in a game similar to the Ultimatum Game, and of which an Ultimatum Game could be interpreted as a subgame, but where the past history of an agent's retributive actions is visible to other agents, strategies exhibiting strong reciprocity can evolve. This model is notable for its conservatism: It presupposes no special features in the structure of the population, relies solely upon potential benefits to kin and offspring, and requires only punishment (and not also reward) as an explanation of the behavior. The model also is consistent with a number of findings on the nature of emotions and related forms of motivation.

Contractor Reports*

*These are additional reports submitted by contractors which are not listed in the previous categories.

CR 2008-01

Feasibility of Developing a Common U.S. Army Helicopter Pilot Candidate Selection System: Analysis of U.S. Air Force Data

Diane L. Damos, & R. Bruce Gould. September 2007. (ADA475416)

The U.S. Army's aviator candidate pool, unlike the pools for the U.S. Air Force (USAF) and U.S. Navy (USN), includes military enlisted personnel and civilians, many of whom do not have a 4-year college degree. Existing tests, such as the Air Force Officer Qualifying Test (AFOQT), may be too difficult for a substantial subset of Army aviator candidates, failing to produce a sufficient spread of scores at selection points. The analyses evaluated the difficulty of the AFOQT for a sample of USAF personnel that should be similar in education to the U.S. Army aviator applicant populations. The analyses compared score distributions of the AFOQT subtest and composite scores for different sample sources. The AFOQT was more difficult for the Air Force enlisted personnel than for other commissioning source applicants. However, the subtest and composite score distributions are sufficient to discriminate well between enlisted personnel if the AFOQT or a similar aptitude test is used for selection. On the highly timed subtests of the Pilot Composite, such as the Instrument Comprehension and Table Reading tests, there is almost no difference between the examinee subpopulations.

CR 2008-02

Measuring Learning and Performance in Collective Training Exercises

David H. McGilvray, Bruce C. Leibrecht, & Karen J. Lockaby. March 2008. (ADA480052)

The goal of the research described in this report was to develop a proof-of-principle scoring system that can be used to evaluate training effectiveness across diverse scenarios. The focus was on supporting evaluators as they evaluate and track unit performance across scenarios. The report describes the products of the research as well as the insights and lessons learned. A scoring system with a computer interface suitable for a hand-held computer was developed and tried out with Infantry subject matter experts acting as evaluators observing virtual scenarios. The try-out provided empirical data on the utility of the scoring system and on desired improvements. Based on feedback from the try-out, the scoring system was revised. The report contains findings and lessons learned that can guide future efforts to automate evaluator and Observer/Controller (O/C) support tools.

CR 2008-06**Cultural Behavior Generation**

Douglas A. Reece, & Glenn Taylor. April 2008. (ADA479977)

Virtual training environments need culturally-appropriate human behavior simulations to train U.S. Army personnel to accomplish military tasks in foreign environments. We surveyed existing cultural behavior models and systems, identifying promising concepts that can be incorporated into a cultural cognitive architecture. We considered different training applications and identified a “knock-and-talk” house visitation scenario as representative of scenarios that require cultural awareness on the part of a trainee, yet avoided open-ended interaction between the trainee and the environment. We developed the core concept for a cultural cognitive architecture based on the incorporation of a behavior schema recognition and processing mechanism into an existing cognitive model. This technical approach was demonstrated in a functional prototype that linked the cognitive behavior model with a high fidelity physical behavior model. We also investigated how these models could be applied in a distributed simulation environment and how they could be integrated into OneSAF. This report details these Phase I project accomplishments.

Special Reports

S 65

U.S. Army Research Institute Program in Basic Research FY 2005 and FY 2006

Basic Research Unit. November 2007. (ADA475117)

This document contains detailed summaries for each of the U.S. Army Research Institute's basic research contracts for the fiscal years 2005-2006. These summaries are grouped according to three Basic Research Office program objectives: Providing fundamental knowledge to improve training in complex environments; providing fundamental knowledge to improving leader and team performance; and providing fundamental knowledge for identifying and measuring the attributes and skills that are critical to Soldier recruiting, assignment, performance, and retention in the transforming Army. In addition to summarizing what was done or is being done, each summary also describes the contributions of that research effort to basic behavioral science and suggests how the findings might benefit the Army and other military services.

S 66

U.S. Army Research Institute Program in Basic Research - FY 2007

Basic Research Unit. May 2008. (ADA483383)

This document contains detailed summaries for each of the U.S. Army Research Institute's basic research contracts for the fiscal year 2007. These summaries are grouped according to four Basic Research Unit program objectives: Providing fundamental knowledge to improve training in complex environments; providing fundamental knowledge to improving leader and team performance; providing fundamental knowledge for identifying and measuring the attributes and skills that are critical to Soldier recruiting, assignment, performance, and retention in the transforming Army; and providing fundamental knowledge for organizational behavior and network science research. In addition to summarizing what was done or is being done, each summary also describes the contributions of that research effort to basic behavioral science and suggests how the findings might benefit the Army and other military services.

S 67 Cancelled

Index of ARI Publications

Abbreviations

| | | | |
|-----------|-------------------------|-----------|--------------------------|
| TR | Technical Report | RN | Research Note |
| RR | Research Report | CR | Contractor Report |
| RP | Research Product | S | Special Report |
| SR | Study Report | | |

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TR 1214

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Information Management Joint Readiness Training Center Job Performance Aids FBCB2

RR 1884**Exploring the Potential Value of OneSAF at the Small-Unit Level**

OOS, OneSAF, simulations, mission planning, course of action analysis, COA, constructive simulations, officer training, course of action comparison, mission rehearsal

RR 1885**Training Effectiveness Assessment of Red Cape: Crisis Action Planning and Execution**

Crisis response training, interagency training, training assessment, theme-based training, overconfidence

RR 1886**Collaborative Planning in Network-Enabled Co-Located and Distributed Environments**

Collaborative planning, future force, future combat systems, mission command, command and control

RR 1887**Fidelity Requirements for Army Aviation Training Devices: Issues and Answers**

Flight simulation, helicopter flight training, military aviation training, simulator fidelity, training effectiveness of military aviation simulators, aviation training systems, motion cueing systems, collective training

RESEARCH PRODUCTS**RP 2008-01****A U.S. Army Reserve (USAR) Noncommissioned Officer (NCO) Tacit Knowledge Inventory: Flexible Structure for Squad-Level Leader Self-Development**

Tacit knowledge, NCO development, U.S. Army Reserve, leader effectiveness, meta-cognitive knowledge, organizational learning

RP 2008-02**After Action Review Tools for Dismounted Soldier Systems**

After action review, aar, embedded training, digital aar, training assessment, training feedback, small unit evaluation, ground Soldier system, land warrior, future force warrior

STUDY REPORTS**SR 2008-01****Cross-Cultural Competence in Army Leaders: A Conceptual and Empirical Foundation**

Cross-cultural competence, cultural understanding, culture, intercultural communication

SR 2008-02**Longitudinal Junior Noncommissioned Officer Promotion Analysis**

Performance(human), aptitude tests, noncommissioned officers, Army personnel, manpower, classification, personnel selection, army planning, promotion (advancement)

SR 2008-04**Building Cultural Capability for Full-Spectrum Operations**

Cross-cultural competence, cultural understanding, culture, intercultural communication

SR 2008-05**Program Evaluation Metrics for U.S. Army Lifelong Learning Centers (LLCs):
Extension to Military Operational Specialty(MOS)-Based LLCs**

Lifelong learning, technology-assisted instruction, computer-based training, educational program evaluation, learning effectiveness metrics

RESEARCH NOTES**RN 2008-01****A Cost-Benefit Analysis Applied to Example Proposals for Army Training and Education Research**

Army training, learning science, cost-benefit analysis, cost-effectiveness analysis

RN 2008-02**Relations between Select21 Predictor Measures and First-Term Attrition**

First-term enlisted Soldier attrition, personnel tests, attrition forecasting, attrition management

RN 2008-04**List of U.S. Army Research Institute Research and Technical Publications
for Public Release/Unlimited Distribution Fiscal year 2007.**

Army Research Institute; research and development; studies and analysis; training; personnel

RN 2008-05**Training for Rapid Interpretation of Voluminous Multimodal Data**

Training, decision-making, training evaluation, military training, decision biases

RN 2008-07**Evaluating the O*NET Occupational Analysis System for Army Competency
Development: Supplemental Appendices**

Competency, O*NET, job analysis, officers

RN 2008-08**An Evolutionary Game Theory Model of Revision-Resistant Motivations and
Strategic Reasoning**

Evolutionary game theory, altruism, strong reciprocity, individual selection, evolutionary theories, behavioral evolution, emotion

CONTRACTOR REPORTS

CR 2008-01

Feasibility of Developing a Common U.S. Army Helicopter Pilot Candidate Selection System: Analysis of U.S. Air Force Data

Aviator, pilot, selection, ASVAB, AFOQT

CR 2008-02

Measuring Learning and Performance in Collective Training Exercises

Scoring systems, evaluation tools, team performance, infantry squad evaluation, small unit performance, hand-held computer tools, collective training, training evaluation, unit performance measurement

CR 2008-06

Cultural Behavior Generation

SBIR Report, cultural behavior modeling, simulation-based training

SPECIAL REPORTS

S 65

U.S. Army Research Institute Program in Basic Research FY 2005 and FY 2006

Training, leadership, team performance, recruitment, assessment, performance evaluation, retention, adaptability, motivation, social networks, work behavior

S 66

U.S. Army Research Institute Program in Basic Research - FY 2007

Training, leadership, team performance, assessment, performance evaluation, adaptability, motivation, social networks, work behavior, network science

FY08 Books and Book Chapters

- Belanich, J., Orvis, K., Horn, D., & Solberg, J. (2008). Bridging Game Development and Instructional Design. In (R. Ferdig, Ed.), *The Handbook of Research on Effective Electronic Gaming in Education* (pp. 1088-1103). Hershey, PA: Idea Group (IGI).
- Burke, C. S, Hess, K.P., Priest, H., Rosen, M., Salas E., Paley, M, & Riedel, S. (2008). Facilitating leadership in a global community: A training tool for multicultural team leaders. In S. Reddy, (Ed). *Managing multicultural teams*. Hyderabad, India: The Icfai University Press.
- Day, D.V., Harrison, M. M. and Halpin, S.M. (2008). *An integrative approach to leader development* (2009). New York, NY: Routledge – The Psychology Press.
- Stagl, K. C., Salas, E., Rosen, M., Priest, H. A., Burke, C. S., Goodwin, G. F., & Johnston, J. H. (2007). Distributed team performance: A multi-level review of distribution, diversity, and decision-making. In F. Yammarino, & F. Dansereau (Eds.), *Research in Multi-level Issues*, 6, 11-61. Oxford, UK: Elsevier.

FY08 Journal Articles

- Bink, M. L., & Beyerlein, M. M. (2007). Innovating in virtual teams. *The International Journal of Cognitive Technology*, 12(2), 11–16.
- Johnson, D. M. (2007). Helicopter simulator sickness: Age, experience, and amount learned. *International Journal of Applied Aviation Studies*, 7(2), 178-201.
- Martin, D. E., Moore, C., Sloan, L.R., & Legree, P.J. (2007, Fall). Personnel Selection: An Application of the Unobtrusive Knowledge Test. *Journal of Business and Behavioral Sciences*, 16 (1), 14-16.
- Orvis, K. A., Horn, D. B., & Belanich, J. (2008). The roles of task difficulty and prior videogame experience on performance and motivation in instructional videogames. *Computers in Human Behavior*, 24 (5), 2415-2433.
- Rumsey, M. G. (2008). Leadership at the point of death. *PsycCRITIQUES*, 53(5).
- Salo, M., & Siebold, G. L. (2008). Variables impacting peer group cohesion in the Finnish Conscript Service. *Journal of Political and Military Sociology*, 36 (1), 1-18.

- Singer, M.J. (2007, October). The evaluation of a distributed online simulation during a battalion staff exercise. *Proceedings of the Human Factors & Ergonomics Society 51st Annual Meeting*, Baltimore, MD.
- Stewart, J.E. (2008). Locus of control and self-attribution as mediators of hazardous attitudes among aviators: a review and suggested applications. *International Journal of Applied Aviation Studies*, 8, 263-279.
- Tremlett, M., Hartnett, B., & Riedel, S.L. (2007, November). Mastering the battle command digital environment through team training. *Proceedings of the Interservice/Industry Training, Simulation, and Education Conference (I/ITSEC)*, Orlando, FL.
- Tucker, J. S., Sinclair, R. R., Mohr, C. D., Adler, A. B., Thomas, J. L., & Salvi, A. D. (2008). A temporal investigation of the direct, interactive, and reverse relations between demand and control and affective strain. *Work & Stress*, 22, 81-95.
- White, L. A., Young, M. C., Hunter, A. E., & Rumsey, M. G. (2008). Lessons learned in transitioning personality measures from research to operational settings. *Industrial and Organizational Psychology*, 1, 291-295.

FY08 Conference Papers

- Abbe, A., Gulick, L.M.V., & Herman, J.L. (2007, October). *Developing cross-cultural competence in military leaders*. Paper presented at Pedagogy for the Long War: Teaching Irregular Warfare, Quantico, VA.
- Barnett, J. S. (2008, May). *The case for active fratricide avoidance in net-centric c2 systems*. Paper was presented at the Human Factor Issues in Combat Identification Workshop, Gold Canyon, AZ.
- Beal, S.A. (2007, November). *Assessment of two desk-top computer simulations used to train tactical decision making of small unit Infantry leaders*. Paper presented at the Interservice/Industry Training, Simulation, and Education Conference (I/ITSEC), Orlando, FL.
- Belanich, J., Orvis, K., Moore, J., Horn, D., & Solberg, J. (2007, November). *Fact or fiction – Soldiers are gamers: Potential effects on training*. Paper presented at the Interservice/Industry Training, Simulation, and Education Conference (I/ITSEC), Orlando, FL.
- Billings, D. R. & Durlach, P. J. (2008, September). *The effects of input device and latency on ability to effectively pilot a simulated micro-UAV*. Paper presented at Human Factors and Ergonomics Society, New York, NY.

- Bink, M.L., & Goodwin, G. (2007, November). *Combat Veterans Use of FBCB2: Lessons for training*. Paper presented at the Interservice/Industry Training, Simulation, and Education Conference (I/ITSEC), Orlando, FL.
- Bink, M.L. (2007, November). *Virtual-collaboration skill training: A social-intellectual systems approach..* Paper presented at the Interservice/Industry Training, Simulation, and Education Conference (I/ITSEC), Orlando, FL.
- Bludau, T. M., & Legree, P. J. (2008, April). *Breaking Down Emotional Intelligence: A Meta-Analysis of EI and GMA*. Paper presented at the 23rd Annual Conference of the Society for Industrial and Organizational Psychology (SIOP), San Francisco, CA.
- De Visser, E. J., LeGoullon, M., Freedy, A., Weltman, G., Parasuraman, R. (2008, September). *Designing an adaptive automation system for human supervision of unmanned vehicles: A bridge from theory to practice*. Paper presented at the Human Factors & Ergonomics Society Annual Meeting, New York, NY.
- Durlach, P.J. (2007, November) *PACERS: Platoon aid for collective employment of robotic systems*. Paper presented at the Interservice/Industry Training, Simulation, and Education Conference (I/ITSEC), Orlando, FL.
- Durlach, P.J. Wansbury, T.G., & Wilkinson, J.G. (2008, December). *Cultural awareness and negotiation skills training: Evaluation of a prototype semi-immersive system*. Paper presented at the Army Science Conference, Orlando, FL.
- Dyer, J. (2007, November). *Potential value of OneSAF at the small-unit level*. Paper presented at the Interservice/Industry Training, Simulation, and Education Conference (I/ITSEC), Orlando, FL.
- Fischer, S. (2008, July). *Case study in critical thinking*. Paper presented at the 2008 United States Special Operations Command (USSOCOM) Joint Special Education Conference, Hurlburt Field, FL.
- Fu, D., Jensen, R., Ramachandran, S., Hinkelman, E., Salas, E., Rosen, M.A., Upshaw, C.L., & Lampton, D.R. (2008, May). *Authoring effective demonstrations*. Paper presented at the Simulation Technology and Training Conference (SimTecT), Melbourne, Australia.
- Fu, D., Jensen, R., Salas, E., and Lampton, D.R. (2007, November). *Constructing virtual training demonstrations*. Paper presented at the Interservice/Industry Training, Simulation and Education Conference (I/ITSEC), Orlando, FL.
- Goodwin, G. A. (2007, November). *Techniques and practices for training digital operator skills*. Paper presented at the Interservice/ Industry Training, Simulation, and Education Conference (I/ITSEC) Conference, Orlando, FL.

- Goodwin, G.A., Leibrecht, B.C., Wampler, R. L., Livingston, S. C. and Dyer, J.L. (2007, November). *Retention of selected FBCB2 operating skills among infantry captains career course (ICCC) students*. Paper presented at the Interservice/ Industry Training, Simulation, and Education Conference (I/ITSEC) Conference, Orlando, FL.
- Gulick, L. M. V., & Herman, J. (2008, August). *Intercultural competence assessment and development in the U.S. Army*. Paper presented at Academy of Management 2008 Annual Meeting, Anaheim, CA.
- Gulick, L.M.V., Abbe, A., & Herman, J.L. (2008, April). Developing cross-cultural competence: A conceptual and empirical foundation. In C. Paullin and L. Wadsworth (Chairs), *Cross-cultural competence: Can we define, measure, and develop it?* Symposium conducted at the 23rd Annual Conference of the Society of Industrial and Organizational Psychology (SIOP), San Francisco, CA.
- Gulick, L.M.V., & Herman, J.L. (2008, August). Intercultural competence assessment and development in the U.S. Army. In M. Mendenhall (Chair), *How should we assess and develop intercultural competencies in current and future global leaders?* Symposium conducted at the Academy of Management 2008 Annual Meeting, Anaheim, CA.
- Haynes, J., Zbylut, M., Wason, T. D., & Maloor, P. (2007, November). *The play's the thing. Teaching high level skills through dramatic simulations*. Paper presented at the Interservice/Industry Training, Simulation & Education Conference (I/ITSEC), Orlando, FL.
- Heffner, T. S., Knapp, D. J., Ingerick, M, Hoffman, R., & Owens, K. (2008, May). *U.S. Army classification research (Army Class)*. Paper presented at the Annual Meeting of the Technical Cooperation Program, Victoria, British Columbia, Canada.
- Heffner, T. S., Tremble, T., & Kilcullen, R. (2008, May). *Prediction of reserve officer training corps (ROTC) completion and commissioning*. Paper presented at the Annual Meeting of the Technical Cooperation Program, Victoria, British Columbia, Canada.
- Heffner, T. S., & Peterson, M. (2008, May). *Mentorship in the U.S. Army*. Paper presented at the Annual Meeting of the Technical Cooperation Program, Victoria, British Columbia, Canada.
- Heffner, T.S., Hoffman, R., Muraca, S., & Hendricks, R. (2008, April). *A selection tool for Soldier training: longitudinal development and validation*. Paper presented at the 23rd Annual Conference of the Society for Industrial and Organizational Psychology (SIOP), San Francisco, CA.

- Heffner, T. S., Knapp, D. J., Ingerick, M., Hoffman, R., & Owens, K. (2008, April). *Non-cognitive measures for selecting and assigning enlisted Soldiers*. Paper presented at the bi-annual meeting of the Defense Analysis Seminar, Seoul, South Korea.
- Hill, R., Jr., & Zbylut, M. (2008, April). *Hollywood meets simulations*. Paper presented at the Learning and the Brain Conference, Cambridge, MA.
- Horn, D. B. & Conjar, E. A. (2008, January). *Cognitive social structures of infantry platoons*. Paper presented at the SunBelt XXVIII Conference on Social Network Analysis, Tampa, FL.
- Horn, D. B. & Conjar, E. A. (2007, October), *Perceptions of advice and friendship networks in infantry platoons*. Paper presented at the 2nd USMA Network Science Workshop, West Point, NY
- Horn, D. B. & Conjar, E.A. (2008, January). *Perceptions of advice and friendship networks in us army infantry platoons*. Paper presented at the SunBelt XXVIII Conference on Social Network Analysis, Tampa, FL.
- Johnson, J.W., Houston, J.S., Ervin, K.S., Kilcullen, R.N., & Orvis, B.R. (2008, August). *Interventions for Increasing Officer Career Continuance*. Paper presented at the 2008 Annual Convention of the American Psychological Association (APA), Boston, MA.
- Katz, L.C. (2007, November). *The track assignment classification tool (TACT): A new assessment system for Army aviator assignments*. Paper presented at the Department of Defense Human Factors Engineering Tactical Advisory Group Meeting 58, South Harbor, TX.
- Katz, L.C. (2008, April). *Helicopter pilot assessment*. Paper presented to the Committee on Opportunities in Neuroscience for Future Army Applications Meeting No. 3. The National Academy of Sciences, Washington, DC.
- Keller-Glaze, H., Aude, S., Nicely, K., Zbylut, M., & Karrasch, A. (2008, August). *Sensemaking in counterinsurgency operations*. Paper presented at the Annual Convention of the American Psychological Association (APA), Division 19, Boston, MA.
- Kubisiak, U.C., Horgen, K.E., Lentz, E., Young, M.C., Tremble, T.R., & Legree, P.J. (2008, August). *Enlisted Career Continuance Interventions*. Paper presented at the 2008 Annual Convention of the American Psychological Association (APA), Boston, MA.

- Lampton, D.R., Kring, J., Bliss, J., Martin, G., Saffold, J., & Garrity, P. (2008, February). *Training applications of online distributed multiplayer gaming systems*. Paper presented at the Society for Applied Learning Technology (SALT) New Learning Technology, Orlando, FL.
- Legree, P. J., Psotka J., Bludau, T. M. & Gray, D. M. (2008, April). *Assessing Occupational Knowledge using SJTs derived from Job Analysis Questionnaires*. Paper presented at the 23rd Annual Conference of the Society for Industrial and Organizational Psychology (SIOP), San Francisco, CA.
- Legree, P. J., Psotka J., Bludau, T. M. & Gray, D. M. (2007, December). *Assessing Occupational Knowledge using Situational Judgment Tests derived from Job Analysis Questionnaires*. Paper presented at International Society for Intelligence Research Conference, Amsterdam, Netherlands.
- Legree, P. J., Psotka J., & Bludau, T. M. (2008, September). *Assessing Occupational Knowledge using SJTs derived from Job Analysis Questionnaires*. Invited talk to Personnel Testing Council, Washington, DC.
- Lentz, E., Kubisiak, U. C., Horgen, K. E., Young, M. C., Tremble, T. R., Legree P. J. (2008, August) *Enlisted Career Continuance Interventions*. Paper presented at the 2008 Annual Convention of the American Psychological Association (APA), Boston, MA.
- McGonigle, T.P., Parish, C.M., Mueller-Hanson, R.A., Swartout, E., & Garven, S. (2008, April). *Individual difference predictors of leader influence success*. Paper presented at the 23rd Annual Conference of the Society of Industrial/ Organizational Psychology (SIOP), San Francisco, CA.
- Murphy, J.S. (2008, April). *Evaluating Visual Detection of IEDs*. Paper presented at the 27th Annual Military Operational Research Society (MORS) working group.
- Nanda, S., Lickteig, C. W., & Schaefer, P. S. (2008, March). *A Self-adapting Heuristic for automatically constructing terrain appreciation exercises*. Paper presented at the Society of Photo-Optical Instrument Engineers (SPIE) Defense & Security Conference Orlando, FL.
- Randolph, J.S. (2008, August). *Sociological Research and Military Policy: An In-house Perspective on the Relationship Between Research and Policy*. Paper presented at the Annual Meeting of the American Sociological Association, Boston, MA.
- Rentsch, J., & Abbe, A. (2008, April). *Multicultural perspective taking competencies: A conceptual model and training*. Symposium presentation at the NATO Human Factors and Medicine Panel, Adaptability in Coalition Teamwork, Copenhagen, Denmark.

- Rosenthal, D. B., Russell, T. L., Elfenbein, H. A., Wadsworth, L. A. D., Sanchez-Burks, J., Mathew, J., and Ruark, G. A. (2008, April). *Training Soldiers to decode nonverbal cues in cross-cultural interactions*. Symposium conducted at the 23rd Annual Conference of the Society of Industrial Organizational Psychology (SIOP), San Francisco, CA.
- Rossi, M., Khan, J. M., Lickteig, C. W., Schaefer, P. S. & Burke, T. J. (2007, November). *Anytime , anywhere terrain visualization training*. Paper presented at the Interservice/Industry Training, Simulation, and Education Conference (I/ITSEC), Orlando, FL.
- Rumsey, M. G. (2008, April). Discussion participant in M. Ingerick (Chair), *Advancing work/job analysis: Challenges and opportunities*. Symposium conducted at the meeting of the Society for Industrial and Organizational Psychology (SIOP), San Francisco, CA.
- Sanders, W.R. (2008, June). *Estimating U.S. Army small unit pre-deployment training development requirements*. Paper presented at the Military Operations Research Society Symposium, New London, CT.
- Siebold, G. L. (2007, October). *Social demolition: A hole in military force design*. Paper presented at the 2007 International Biennial Conference of the Inter-University Seminar on Armed Forces and Society, Chicago, IL.
- Siebold, G. L. (2008, February). *Models of the evolving military: Postmodern organizations vs. platform companies*. Paper presented at the 78th Annual Meeting of the Eastern Sociological Society, New York, NY.
- Singer, M.J. & Howey, A.M. (2008, August). *Enhancing learning in augmented or virtual environment*. Paper presented at the Society for Applied Learning Technology Interactive Technologies 2008 Conference, Arlington, VA.
- Stewart, J.E. (2008, May). *Fidelity requirements for Army Aviation training devices: issues and answers*. Paper presented at 59th Meeting of Department of Defense Human Factors Engineering Technical Advisory Group (HFE TAG), Destin, FL.
- Swartout, E., Mueller-Hanson, R.A., Morewits, C.L., McGonigle, T.P., Martin, C., & Garven, S. (2008, April). *Developing leader social awareness and influence in the classroom*. Paper presented at the 23rd Annual Conference of the Society of Industrial/Organizational Psychology (SIOP), San Francisco, CA.
- Van Iddekinge, C. H., Ferris, G. R., & Heffner, T. S. (2008, August). Selection constructs versus methods: The validity of alternative methods for predicting performance. In R. R. Portnoy (Chair), *Advances in Selection Research*. Symposium conducted at the of the Academy of Management 2008 Annual Meeting, Anaheim, CA.

Wesolek, M.L. (2008, April). *Adult basic education in the U.S. Army*. Paper presented at the Commission on Adult Basic Education Conference, St. Louis, MO.

Wesolek, M.L. (2008, April). *ARNG Collective Training Gaps: The National Guards transition from strategic to operational force*. Paper presented at the Army Aviation Association of America (AAAA), Army National Guard Aviation Senior Leaders Conference, National Harbor, MD.

Young, M. C., Tremble, T. R., Kilcullen, R. N., Ervin, K. S., Babin, N. E., Hunter, A. E., Legree, P. J., & White, L. A. (2008, August). *Overview of the Army's Project STAY*. Paper presented at the 2008 Annual Convention of the American Psychological Association (APA), Boston, MA.

Ramsden Zbylut, M. L., & Metcalf, K. (2008, April). *Cross-cultural behavior in the advising environment: Measurement and preliminary findings*. Paper presented at the Joint Center for International Security Forces Assistance (JCISFA) Advisor Training Center Working Group, Fort Leavenworth, KS.

Ramsden Zbylut, M. L., Brunner, J. M., Vowels, C. L., Kim, J. M., & Hill, R. W. (2008, August). *Same case, different audience: The instructional utility of film*. Paper presented at the 2008 American Psychological Association (APA) Annual Convention, Division 19, Boston, MA.

FY08 Poster Sessions

Bink, M.L., Johnson, B.N., & Hall, B.T. (2007, November). *Motor interference on memory tests*. Poster session presented at the 48th Meeting of the Psychonomic Society, Long Beach, CA.

Chertoff, D., Jerome, C.J., Martin, G., & Knerr, B. (2008, September). *GamePAB: A game-based performance assessment battery application*. Poster session presented at the Human Factors and Ergonomics Society, New York, NY.

Conjar, E.A. & Horn, D.B. (2008, April). *Formal and emergent leaders' cognitive accuracy in social networks*. Poster session presented at the 23rd Annual Conference of the Society of Industrial/Organizational Psychology (SIOP), San Francisco, CA.

Conjar, E.A. & Horn, D.B. (2008, August). *Need for achievement, leadership, and accuracy of social network perceptions*. Poster session presented at the 2008 Annual Convention of the American Psychological Association (APA), Boston, MA.

- Conjar, E.A. & Horn, D.B. (2008, August). *Predicting Work--Family Conflict Via Perceived Involvement and Overload*. Poster session presented at the 2008 Annual Convention of the American Psychological Association (APA), Boston, MA.
- Hoffman III, R.R. (2008, August). *An Exploratory Model for Predicting Army Reenlistment Intentions*. Poster session presented at the 2008 Annual Convention of the American Psychological Association (APA) Annual Convention, Boston, MA.
- Jerome, C.J. & Howey, A.M. (2007, October). *Task performance and workload using an augmented reality attention orienting system*. Poster session presented at the Human Factors and Ergonomic Society, Baltimore, MD.
- Keller-Glaze, H., Aude, S., Nicely, K., Zbylut, M., & Karrasch, A. (2008, August). *Sensemaking in counter-insurgency operations*. Poster session presented at the American Psychological Association (APA) Annual Convention, Division 19, Boston, MA.
- Ross, J.M., Barnett, J.S., & Meliza, L.L. (2007, October). *Effect of audio-visual alerts on situation awareness and workload in a net-centric warfare scenario*. Poster session presented at the Human Factors and Ergonomics Annual Meeting, Baltimore, MD.
- Ruark, G. A., Davis, J., & Connelly, M. S. (2008, April). *Effects of communication medium and leader emotions on subordinate performance*. Poster session presented at the 23rd Annual Conference of the Society of Industrial/Organizational Psychology (SIOP), San Francisco, CA.
- Steele, J., (2008, April). *Conceptual equivalency and inter-rater reliability in 360 leadership assessment*. Poster session presented at the 23rd Annual Conference of the Society of Industrial/Organizational Psychology (SIOP), San Francisco, CA.

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